METIANU, I., ing.; SACHELARESCU, V., ing.

Applying electrosharpening of cutting tools plated with metallic carbide in the wood industry. Ind lemnului 16 no.1:8-14 Ja '65.

1. Forest Research Institute, Bucharest.

SACHELARIE, Mircea, ing.

Metalloceramic filters. Metalurgia si constr mas 15 no.3: 199-202 Mr '63.

1. Institutul de Cercetari Metalurgice.

VALENT, Robert; NERSESIAN, Sarchis; PETRESCU, Stefania; POPESCU, Andrei; SACHELARIE, Traian

Some problems of the driving program in machine tools. Probleme automatiz 4:235-245 '62.

L 45783-65 EWT(d)/EWP(c)/EWA(d)/EWP(v)/T/EWP(k)/EWP(h)/EWP(l)

ACCESSION NO: AP5004779 RU/0011/64/008/004/0181/0182

AUTHOR: Predoi,A. (Engineer); Mehedinti, D. (Engineer); Sachelarie, Tr. (Engineer)

TITLE: Achievements in the field of machine-tool automation

SOURCE: Automatica si electronica, v. 8, no. 4, 1964, 181-182

TOPIC TAGS: automation, machine tool, machine tool industry

Abstract: In the field of machine-tool automation, approximately 65 electrotechnical elements were put into production in the period 1961 through 1963. They included control buttons, direction manipulators, etc.; tranformers for control circuits; miniature relays, etc. Among the principal devices developed was a system for the programmed control of lathes at the Arad Lathe Factory, with the program recorded on magnetic tape.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: IE

NO REF SOV: 000 OTHER: 003 JPRS

Card 1/1

L 10434-67 EWT(d)/EWT(m)/EWP(w)/EWP(v)/EWP(k) IJP(c) EM/WW

ACC NR: AT6032966 SOURCE CODE: UR/3228/64/000/002/0111/0126

25

AUTHOR: Agenosov, L. G.; Sachenkov, A. V.

ORG: none

TITLE: Stability and free vibrations of the cylindrical and conical shells of a circular cross section under various boundary conditions

SOURCE: Kazan. Universitet. Issledovaniya po teorii plastin i obolochek, no. 2, 1964, 111-126

TOPIC TAGS: free oscillation, orthotropic shell, shell structure stability, cylindric shell structure, conic shell structure

ABSTRACT: After a survey of numerous papers by other authors dealing with the stability and free vibrations of thin isotropic supported cylindrical and conical shells under various boundary conditions, the present authors come to the conclusion that the formulas so far suggested for the determination of the frequencies of vibrations of the conical shells are cumbersome, and that their applicability range is not well defined. The present paper investigates the stability and small extra-axial free vibrations of structurally orthotropic cylindrical and conical shells under the action of axial compression and external pressure under various boundary conditions: six types of clamping for the cylindrical and three types for conical shells. The

Card 1/2

L 10434-67

ACC NR: AT6032966 O

inertial forces in the normal and circular directions are taken into account, and the effect of the boundary conditions on the lowest frequency of the free vibrations of the shell is studied. The results of the calculations agree within the calculation errors, with the results of other authors. Orig. art. has: 1 figure, 4 tables and 46 equations.

SUB CODE: 13/ SUBM DATE: —Jun63/ ORIG REF: 006

Card 2/2 Sm

L 11079-65 EWT(l)/EWG(k)/EEC(t) Pz-6 LJP(c)/SSD/AS(mp)-2/AFWL/ESD(t)
AT
ACCESSION NR: AP4046647 S/0181/64/006/010/3174/3177

AUTHORS: Zuyev, V. A.; Sachenko, A. V.; Tolpy*go, K. B. (B)

TITLE: Kinetics of photoconductivity in semiconductors possessing capture levels for the minority carriers on the surface

SOURCE: Fizika tverdogo tela, v. 6, no. 10, 1964, 3174-3177

TOPIC TAGS: photoconductivity, semiconductor band structure, surface property, carrier capture, carrier adhesion

ABSTRACT: The authors calculate the dependence of the photoconductivity on the light modulation frequency in the presence of capture and adhesion on the surface of a semi-infinite semiconductor of the n-Ge type. The system of differential equations for the electron density n, the hole density p, and the field E is solved assuming a quasi-Boltzmann carrier distribution and under certain appropriate boundary conditions. The result is an approximate expression for

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L 11079-65
ACCESSION NR: AP4046647

the photoconductivity, consisting of two terms, one for the bipolar photoconductivity in the space-charge region and the other for the unipolar photoconductivity due to the conductivity of the electrons that cancel the charges of the holes captured on the surface. The bipolar photoconductivity arises essentially in the space charge region, while the unipolar photoconductivity is significant in the case when the bands at the surface of the semiconductor bend upward. A detailed discussion of the results and an analysis of the assumptions made in the derivation of the formula for the photoconductivity will be published in UFZh (Ukrainian Physics Journal). Orig. art. has: 2 figures and 6 formulas.

ASSOCIATION: Institut poluprovodnikov, AN UkrSSR, Kiev (Institute of Semiconductors, AN UkrSSR)

SUBMITTED: 20Mar64 ENCL: 00

SUB CODE: SS NR REF SOV: 006 OTHER: 002

Card 2/2

ACC NR: AR6030897 (N) SOURCE CODE: UR/0124/66/000/006/V009/V009

AUTHOR: Sachenkov, A. V.; Vybornov, V. G.

TITLE: The effect of initial irregularities on the stability of thin shells

SOURCE: Ref. zh. Mekhanika, Abs. 6V65

REF SOURCE: Sb. Issled. po teorii plastin i obolochek. No. 3. Kazan', Kazansk. un-t, 1965, 24-34

TOPIC TAGS: thin shell structure, shell theory, cylindric shell structure

TRANSLATION: Thin elastic shells are studied for the effect of initial irregularities in the form of their average surface at values of upper and lower critical loads. It is shown that for such irregularities the study of the stability of a cylindrical shell of radius R and bending rigidity D reduces, with a certain error, to that of a shell not having irregularities but with geometric (R_1, D_1), mechanical, and static characteristics, which are indicated. The following cases are analyzed: the simultaneous effect on a shell of axial compression, twisting and external pressure; local stability of a cylinder under axial compression and of a sphere under external pressure; the stability of a hinge-supported cylindrical shell under compression from all sides, and of a fixed shell under hydrostatic pressure. Examples are given for determining critical loads for shells with a known value of initial irregularity. 7 references. T. N. Vasitsyna.

SUB CODE: 20 /15/

Card 1/1

ACC NR: AR6030402 (N) SOURCE CODE: UR/0124/66/000/006/V014/V014

AUTHOR: Sachenkov, A. V.

TITLE: Stability of ring-shaped plates and a sloping truncated spherical shell under shearing forces

SOURCE: Ref. zh. Mekhanika, Abs. 6V99

REF SOURCE: Sb. Issled. po teorii plastin i oblochek. No. 3. Kazan', Kazansk. un-t, 1965, 35-42

TOPIC TAGS: shell structure stability, spheric shell structure, orthotropic shell

TRANSLATION: The method of mathematical analogy is used to study linear problems of the stability under shear forces of closed and unclosed elastic isotropic thin circular ring-shaped plates and a truncated sloping spherical cupola with a momentless initial state. The idea of applying the method of mathematical analogy consists in the fact that the transformed equation for the stability of a ring-shaped plate under shear reduces to a certain stability equation having a known solution (for example, for an infinite strip) by means of the elimination of several terms in view of their assumed "insignificant contribution" in comparison with those which are retained; then critical parameters of the problem are borrowed from these known by introducing constants. By this method, stability problems are solved for a closed ring-shaped plate having fixed

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ACC NR: AR3030402

and freely supported edges. An application of the method to the stability of orthotropic shells is shown. In applying the method to the solution of the problem of stability of a truncated sloping spherical shell with the simultaneous effect of shear forces and uniform internal pressure, the stability equation is given in complex form. Numerical results are given to show that the method is satisfactory. B. G. Gazizov.

SUB CODE: ~~20,12~~ 13, 12

Card 2/2

ACC NR: AR6024062 SOURCE CODE: UR/0124/66/000/004/V019/V019

AUTHOR: Galimov, N. K.; Sachenkov, A. V.

TITLE: Determination of the frequencies of free vibrations and the stability of sloping three layered spherical shells and plane plates

SOURCE: Ref. zh. Mekhanika, Abs. 4V144

REF SOURCE: Sb. Issled. po teorii plastin i obolochek. No. 3. Kazan', Kazansk. un-t, 1965, 148-156

TOPIC TAGS: vibration analysis, spheric shell structure, shell stability

ABSTRACT: An anology is established between problems of free vibrations of a simply supported three-layered spherical shell restricted in plan by rectilinear segments with the well-known problem of oscillations of a plane membrane. The structure of the shell is considered to be asymmetric with respect to thickness. The materials of the layers are isotropic with equal Poisson ratios. The transverse compressibility of the filler is not taken into account. Theorems are formulated relative to the fundamental frequency of a simply supported, mildly sloping three-layered spherical shell and a plane three-layered plate, the validity of which is proved for a plane membrane. Axisymmetric vibrations and the stability of sloping spherical domes in plan by a circular region are also examined. [Translation of abstract] A. G. Gorshkov

SUB CODE: 20

Card 1/1

L 9704-66 EWT(1)/T/EWA(h) IJP(c) GG/AT

ACC NR: AP5027455 SOURCE CODE: UR/0181/65/007/011/3472/3474

AUTHOR: Tyagay, V. A.; Sachenko, A. V.

ORG: Institute of Semiconductors AN UkrSSR, Kiev (Institut poluprovodnikov AN UkrSSR)

TITLE: Calculation of quantum effects in the layer theory for space charge in semiconductors

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3472-3474

TOPIC TAGS: semiconductor theory, space charge, quantum electronics, theoretic physics

ABSTRACT: The authors consider the expression for the density matrix of an ideal gas with a quasi-continuous energy spectrum in the single-electron approximation. Equations are given for the density matrix of a non-degenerate gas limited to infinitesimals of the second order. Equations are derived for the density of electrons and holes in the junction zone. Orig. art. has: 6 formulas.

SUB CODE: 20/ SUBM DATE: 09Mar65/ ORIG REF: 002/ OTH REF: 006

Card 1/1

ZUYEV, V.A. [Zuiev, V.O.]; SACHENKO, A.V.; TOLPYGO, K.B. [Tolpyho, K.B.]

Kinetics of photoconductivity in semiconductors with the trapping levels for minority current carriers on the surface. Ukr. fiz. zhur. 10 no.3:275-286 Mr '65. (MIRA 18:6)

1. Institut poluprovodnikov AN UkrSSR, Kiyev.

L 8300-66 EWT(1)/T/EWA(h) IJP(c) AT

ACC NR: AP5028920 SOURCE CODE: UR/0185/65/010/011/1176/1186

AUTHOR: Zuyev, V. O. -- Zuyev, V. A.; Sachenko, A. V.; Tolpygo, K. B. -- Tolpygo, K. B.

ORG: Institute of Semiconductors, AN UkrSSR (Instytut napivprovidnykiv AN UkrSSR)

TITLE: Kinetics of photoconductivity of thin semiconductor layers having surface levels of attachment and recombination

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 11, 1965, 1176-1186

TOPIC TAGS: photoconductivity, semiconductivity, semiconductor carrier, relaxation process

ABSTRACT: An investigation was made of the photoconductivity of a semiconductor of finite thickness having attachment and recombination levels on the surface. A general expression for photoconductivity σ was derived, with the aid of which the dependence of σ on the absorption coefficient and the frequency can be obtained. In deriving σ the following assumptions were made: 1) the impurity semiconductor is of the n-type and its donors are totally ionized. There is no attachment in the volume and the nonequilibrium carriers are characterized by the volume lifetime τ. 2) In the region of volume charge the distribution of carriers is of quasi-Boltzman type. 3) The additional concentration of holes p_1 in the essential region $x \sim (2—3) L_p$ considerably exceeds equilibrium p_0. The cases of sinusoidal, rectangular, and δ-form modulation

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ACC NR: AP5028920

of light were considered. For "thin" specimens ($d < |L_p|$) a time dependence of photoconductivity was obtained in case of Π- and δ-modulation. This dependence shows that in a limiting case of a fast exchange of surface levels with bands, the relaxation of photoconductivity is monoexponential. In this case the characteristic time of the photoconductivity decrease is the lifetime of the nonequilibrium carriers. If τ_{eff} is known, the rate of surface recombination S can be determined. When the lifetime of carriers of the levels is considerable, the relaxation of photoconductivity is not monoexponential. For a model with one surface level there are two exponential sections of photoconductivity relaxation. One characterizes the carrier recombination in the volume and on the surface, and the other is linked with the monopolar part of the photoconductivity. The second section can be attributed to the capture of minority carriers of the surface level. Orig. art. has: 3 figures and 36 formulas. [JA]

SUB CODE: 20/ SUBM DATE: 15Dec64/ ORIG REF: 009/ OTH REF: 004/ ATD PRESS: 4149

Card 2/2

TSFAS, B.S., dotsent, kand.tekhn.nauk; SACHENKO, I.K., student

Unifying dependences of modern calculation of gears for contact stresses. Sbor.dokl.Stud.nauch.ob-va Fak.mekh.sel'. Kuib.sel' khoz.inst. no. 1:106-108 '62. (MIRA 17:5)

1. Kuybyshevskiy sel'skokhozyaystvennyy institut.

L 55344-65 EWT(d)/EED-2/EWP(1) Pq-4/Pg-4/Pk-4 IJP(c) BB/GG/GS
ACCESSION NR: AT5014624 UR/0000/65/000/000/0051/0054
681.142:324

AUTHOR: Sachenko, M. M.

TITLE: Use of magnetic amplifiers in decoding circuits

SOURCE: Vsesoyuznoye soveshchaniye po magnitnym elementam avtomatiki i vychisli-tel'noy tekhniki, 9th, Yerevan, 1963. Magnitnyye analogovyye elementy (Magnetic analog elements); doklady soveshchaniya, Moscow, Izd-vo Nauka, 1965, 51-54

TOPIC TAGS: magnetic amplifier, magnetically amplified decoder, decoding circuit, automatic control system, conversion error

ABSTRACT: The use of discrete computers for automatic control of technological processes requires the construction of devices which convert numbers into physical quantities characterizing the objects under control. The paper describes one of the possible magnetic amplifier schemes used within decoders (see Fig. 1 of the Enclosure). The complete decoder also contains an input device which rectifies, filters, and stabilizes (S. D. Dodik, Izmeritel'naya tekhnika, 1959, no. 6) the current which is fed to the control winding from the memory register. The conversion error due to the nonlinear characteristic is 0.4%. Additional

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ACCESSION NR: AT5014624

error for the temperature change 15-30C is 0.2%. Power supply voltage and frequency variations of ±5% generate errors within ±0.4%. Orig. art. has: 10 formulas and 3 figures.

ASSOCIATION: None

SUBMITTED: 28Dec64 ENCL: 01 SUB CODE: DP, IE

NO REF SOV: 003 OTHER: 001

Card 2/3

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ACCESSION NR: AT5014624 ENCLOSURE: 01

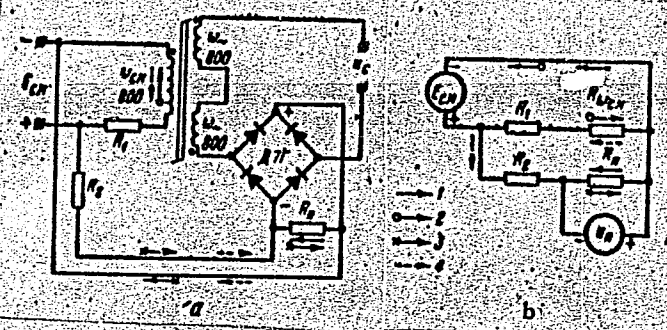

Figure 1. Magnetic amplifier circuit containing a combined displacement loop (a) and the equivalent displacement circuit (b). 1 - Load current; 2 - Displacement current; 3 - Compensation current; 4 - Negative feedback current.

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MARSHALKOVICH, D.B., polkovnik meditsinskoy sluzhby; SACHENKO, N.L., podpolkovnik meditsinskoy sluzhby; BELOUSOV, G.G., podpolkovnik meditsinskoy sluzhby; NOVIKOV, I.I., mayor meditsinskoy sluzhby; FURMAN, M.A., mayor meditsinskoy sluzhby

Organization of work at a receiving and sorting section of a therapeutic hospital. Voen.-med. zhur. no.6:15-17 Je '61. (MIRA 14:8)
(HOSPITALS) (RADIATION SICKNESS)

MARSHALKOVICH, D.B., polkovnik meditsinskoy sluzhby; SACHENKO, N.L., podpolkovnik meditsinskoy sluzhby; AZBUKIN, G.V., podpolkovnik meditsinskoy sluzhby; BELOUSOV, G.G., podpolkovnik meditsinskoy sluzhby; KITAYGORODSKIY, N.I., podpolkovnik meditsinskoy sluzhby; FIL'IPPOVICH, B.A., podpolkovnik meditsinskoy sluzhby

Rendering of emergency aid at the regimental medical aid station to persons poisoned with toxic organophosphorus substances. Voen.-med. zhur. no.3:19-22 '65. (MIRA 18:11)

Sachenko V.P.

48-10-3/20

AUTHOR: Blokhin, M.A., Sachenko, V.P.

TITLE: The Breadths of the Internal Levels and the Distribution of Electron States According to the Energies of the Elements of the Iron Transition Group (Shiriny vnutrennikh urovney i raspredeleniye plotnosti elektronnykh sostoyaniy po energiyam elementov perekhodnoy gruppy zheleza)

PERIODICAL: Izvestiya Akad.Nauk SSSR, Ser.Fiz., 1957, Vol. 21, Nr 10, pp. 1343-1350 (USSR)

ABSTRACT: The attempt is made here to determine the breadth of the K-levels of some elements by means of the interpolation on these elements of the experimental values for the K-level breadths of intransitive elements (Mg, Al, Ar, K, Fe). When detecting the changes of the breadth of K-levels by means of the atomic number two essentially different types of transition, the radiation- and the radiationless transitions, were taken into account. The entire probability for the emergence of the atom from the given state is equal to the sum of the probability of the radiation transition P_p and the radiationless P_l. The level breadth $\gamma = A(P_p+P_l)$. A - coefficient, the value of which is determined by the shape of the level. The ratio of these probabilities can be computed also experimentally. It is shown that the com-

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SACHENKO, V. P., Cand Phys-Math Sci (diss) -- "The width of internal levels and the distribution of electrons by energies in elements of the iron transition group". Rostov na Donu, 1960. 9 pp (Min Higher Educ USSR, Rostov State U), 150 copies (KL, No 14, 1960, 126)

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S/048/60/024/04/06/009
B006/B017

24.6300

AUTHORS: Blokhin, M. A., Sachenko, V. P.

TITLE: On the Problem of the Shape of the Energy Bands of a Solid

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 4, pp. 397-406

TEXT: The present article is a reproduction of a lecture delivered at the 4th All-Union Conference on X-Ray Spectroscopy (Rostov-na-Donu, June 29 - July 6, 1959). Since the experimentally observed shape of X-ray emission bands is only in approximate agreement with the theoretically computed one, the authors endeavor to improve the theory by taking into account the distortions due to the apparatus and the line broadening. In the introduction, the results of some investigations undertaken by other authors are discussed. Among others, Landsberg (Ref. 4) computed the form of the L_{III} sodium emission band by taking into account the broadening of the conduction band levels, i.e., in free-electron approximation by means of a perturbation of the form $\exp(-ar_{12})/r_{12}$.

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On the Problem of the Shape of the Energy Bands of a Solid

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B006/B017

These computations show, however, some deficiencies which are discussed here. Above all, the level broadening in the conduction band was investigated only in connection with the emission of an X-ray photon; however, it occurs in all experiments on energy bands of solids. Hence, it must be taken into account not only in X-ray spectroscopy but also in investigating optical spectra, the photoeffect, and electrical conductivity. The authors of the present paper give an exact computation of the problem investigated by Landsberg (in free-electron approximation). They study again the influence exercised by level broadening on the shape of X-ray emission bands and the energy distribution of electrons in the bands of the solid. Two conduction electrons with the wave vectors $\vec{k}_2$ and $\vec{k}_3$ are examined. One is to fill a vacancy (with the wave vector $\vec{k}_1$) after a collision, and the other is to pass over into a state with $\vec{k}_4$. For $\vec{k}_2+\vec{k}_3 = \vec{k}_1+\vec{k}_4$ an explicit expression is obtained for the probability $W_A(k_1)$ after some operations. $2W_A(k_1)$ is the total transition probability to the $\vec{k}_1$ level when the exchange effects are

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On the Problem of the Shape of the Energy Bands of a Solid

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subject are discussed. In conclusion, the authors state that the level broadening in the energy bands explains some characteristic features of X-ray spectra, and that it is of universal importance in solid-state physics. A. F. Ioffe and Samoylovich are mentioned. There are 4 figures and 11 references: 3 Soviet, 4 American, and 4 British.

ASSOCIATION: Rostovskiy-na-Donu gos. universitet (Rostov-na-Donu State University)

Card 4/4

S/126/61/011/006/007/011
E032/E314

9,4300 (1035,1043,1160)

AUTHORS: Sachenko, V.P. and Chechin, G.M.

TITLE: On the Probability of Radiationless Transitions in the Conduction Bands of Alkali Metals

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol. 11, No. 6, pp. 935 - 941

TEXT: In the case of metals at not too low a temperature and electrons in the energy range of the order of kT from the Fermi surface the probability of electron-phonon collisions is much greater than the probability of electron-electron collisions. However, electron-electron collisions become important in the case of conduction-band excitation energies greater than kT (Ref. 1: Landsberg, P.T. - Proc.Phys.Soc., 1949, A62, 806; Ref. 2: Blokhin, M.A., Sachenko, V.P. Izv. Ak.nauk SSSR, Ser.fiz., 1960, Vol. 24, No. 4, 397). However, the latter authors have used the Born approximation to compute the probability of radiationless transitions. It is stated that this method does not, strictly speaking, apply in the case

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of conduction electrons and, moreover, there is an error in Eq. (10) of Ref. 2. The present authors report an attempt to compute the probability of radiationless transitions without the use of the Born approximation. The problem is formulated as follows. Consider the excited state of the conduction band from which an electron with a wave vector k_1 is absent. Let $P(\underline{k}_1, \underline{k}_2, \underline{k}_3, \underline{k}_4)$ be the probability per unit time of a radiationless transition, as a result of which the wave vectors of two electrons $\underline{k}_2$ and $\underline{k}_3$ become equal to $\underline{k}_1$ and $\underline{k}_4$, respectively. The total probability $P(\underline{k}_1)$ that the vacancy $\underline{k}_1$ will be filled is obtained by integrating $P(\underline{k}_1, \underline{k}_2, \underline{k}_3, \underline{k}_4)$ over all possible values of $\underline{k}_2$, $\underline{k}_3$, $\underline{k}_4$ which are allowed by the momentum and energy-conservation law

$$\underline{k}_2 + \underline{k}_3 = \underline{k}_1 + \underline{k}_4 , \quad k_2^2 + k_3^2 = k_1^2 + k_4^2 \qquad (1),$$

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The values of k_i (at absolute zero) must, of course, lie below the limiting Fermi value k_F, i.e.

$$k_4 \geq k_F, \quad k_1 \leq k_2 \leq k_F, \quad k_1 \leq k_3 \leq k_F \qquad (2).$$

The potential energy of the electrons is then assumed to be of the form

$$U(r) = \frac{e^2}{r} e^{-\alpha r} \qquad (3)$$

where r is the distance between the electrons and
α is a constant of the order of 1Å^{-1} (both α and the wave vectors are expressed in units of Å^{-1}).
In the Hartree-Fock approximation P will not contain exchange terms (Ref. 1). Thus the problem is reduced to the determination of $P(\underline{k}_1, \underline{k}_2, \underline{k}_3, \underline{k}_4)$. In the centre of

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mass system of two colliding electrons, P is a function of the following two vectors

$$\underline{k}_0 = \frac{1}{2}(\underline{k}_3 - \underline{k}_2), \quad \underline{k} = \frac{1}{2}(\underline{k}_4 - \underline{k}_1) \qquad (4) .$$

The Born approximation will not apply since the sufficient condition for the applicability of this approximation ($ka \ll 1$) is (Ref. 3: Landau, L., Lifshits, E. - Kvantovaya mekhanika, No. 1, GITTL, Moscow-Leningrad, 1948)

$$V \ll \frac{h^2}{\mu a^2} \qquad (5) .$$

In this expression, $\mu = m/2$,

m is the electron mass,
a is a linear dimension of the region within which the potential is

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V appreciably different from zero, and is the order of magnitude of this potential.

In the present case, $V = e^2/a$, $a \approx 1$ Å and k for alkaline metals is of the order of unity. It is then easy to see that the condition (5) is not satisfied, and the Born approximation cannot be used. A collision theory is then used to determine the relation between $P(\underline{k}_o, \underline{k})$ and the differential scattering cross-section $\sigma(\vartheta\varphi)$, where ϑ is the angle between $\underline{k}_o$ and $\underline{k}$. Assuming that the probability $dW_{\underline{k}_o, \underline{k}}$ of transition from the state $\underline{k}_o$ into the interval $d\tau_{\underline{k}}$ of the $\underline{k}$ states is given by (Ref. 4: Bethe et al., Mesons, and Fields (Mezony i polya), Vol. 1, 1957, IIL, Moscow, pp.66)

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$$dW_{k_0, k} = \frac{2\pi}{\hbar} |T_{k_0, k}|^2 \delta(E_{k_0} - E_k)\, d\tau_k, \qquad (7)$$

and that only δ_0 need be retained in the partial wave formula

$$\sigma(\theta, \varphi) = \frac{1}{4k^2} \left| \sum_{l=0}^{\infty} (2l+1)[e^{2i\delta_l} - 1] P_l(\cos\theta) \right|^2, \qquad A$$

it is shown that

$$P(k_1, k_2, k_3, k_4) = \frac{8\hbar}{(2\pi)^5 m} \frac{\sin^2\delta_0}{|k_1 - k_2|^2} \delta(k_1^2 + k_2^2 - k_3^2 - k_4^2) \times$$
$$\times \delta(k_4 + k_2 - k_3 - k_3). \qquad (11)$$

The formula for $P(\underline{k}_1)$ then turns out to be:

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Eqs. A and 11 (page 937) attached to slip 24.

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E032/E314

$$P(k_1) = \frac{h}{m\pi} \int_{k_p}^{\sqrt{2k_p^2 - k_1^2}} (2k_p^2 - k_4^2 - k_1^2)\, k_4^2\, dk_4 \int_0^{\pi} \frac{\sin^2 k_0 \sin\theta}{(k_4 - k_1)^2 |k_4 + k_1|}\, d\theta, \qquad (12)$$

The dependence of δ_0 on k is found by numerical integration of the equation

$$\psi'' + \left[k^2 - V(r) - \frac{l(l+1)}{r^2}\right]\psi = 0, \qquad (13)$$

where

$$V(r) = \frac{2\mu}{\hbar^2} U(r).$$

B .

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Fig. 1 shows δ_o versus k curves calculated for α = 0.8, 1.0 and 1.2 . The curve marked B corresponds to the Born approximation (Ref. 5: N.F. Mott and H.S.W. Massey, Theory of Atomic Collisions, IL, Moscow, 1951). Fig. 2 shows $\sin \delta_o/k$ as a function of k for different values of α . Next, the calculations are specialised to the case of sodium (k_F = 0.914). Suppose k_1 = 0 , then the angular integral in Eq. (12) can easily be evaluated and the range of k is shown by the vertical lines in Fig. 2. It is clear from Fig. 2 that in this region

$$\sin \delta_o/k = a - bk \qquad (13) .$$

Substituting this expression into Eq. (12) and bearing in mind that the relation between the excited-state lifetime Δt and the corresponding energy width is $\Delta E.\Delta t \sim h$, one is led to the expression

On the Probability of ....

$$\Delta E(0) = 1{,}21 k_F^4 \left[a^2 - \frac{4ab}{15}(8\sqrt{2} - 7) k_F + \frac{b^2}{3} k_F^2 \right]. \qquad (16)$$

where the energy is in eV. Calculations showed that with $\alpha = 1.2$, $\Delta E(0) = 0.30$ instead of the value 0.77, which was obtained in Ref. 1. Thus the Born approximation leads to a result which is too high by a factor of 2-3. Fig. 2 indicates that the approximation (15) can be used also for $k_1 \neq 0$, particularly for large α. The final expression is found to be

$$\Delta E(k_1) = 1{,}21 \left[a^2 (k_F^2 - k_1^2)^2 + \frac{b^2}{3}(k_F^2 - k_1^2)^2 (k_F^2 + k_1^2) \right] -$$

$$- 2{,}42ab \left\{ \frac{2}{3} \frac{k_F^6}{k_1} \arcsin \frac{k_1 \sqrt{2k_F^2 - k_1^2}}{k_F^2} - \right.$$

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Eq. (16) (page 938) attached + to Mod 24.

On the Probability of ....

$$-\frac{1}{6}(k_F^2+k_1^2)^2(2k_F^2-k_1^2)\arcsin\frac{2k_Fk_1}{k_F^2+k_1^2}+$$

$$+\frac{1}{45}\left[\sqrt{2k_F^2-k_1^2}\,(18k_F^4+22k_F^2k_1^2-8k_1^4)-\right.$$

$$\left.-k_F(12k_F^4+35k_F^2k_1^2-15k_1^4)\right]. \qquad (17)$$

and this is plotted in Fig. 3 for $\alpha = 0.8$ and 0.6 . It can be shown that this expression can be approximated-to by

$$\Delta E(k_1) = 1{,}21\tau^2(k_F^2-k_1^2)^2. \qquad (18)$$

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On the Probability of ....

where $\gamma = \sin \delta_o / k$. These two formulae do not differ by more than 6% for $\alpha \geqslant 0.6$. Fig. 4 shows the theoretical and experimental curves for the emission L_{III} band of sodium (Curve 1 - experimental (Ref. 6: Skinner, H.W.B. Rep. Progr. Phys., 1938, 5, 257); Curve 2 - theoretical curve obtained for $\Delta E(0) = 1.73$ ($\alpha = 0.6$)).
There are 4 figures and 7 references: 4 Soviet and 3 non-Soviet. The English-language reference not mentioned above is: Ref. 7 - D. Pines. Adv. Solid, State Phys., 1956, 1,N.Y.

ASSOCIATION: Rostovskiy-na-Donu gosudarstvennyy universitet
(Rostov-on-Don State University)

SUBMITTED: August 26, 1960

Card 11/13

SACHENKO, V.P.

Finding the true form of spectra with the aid of Shannon's approximation method. Izv. AN SSSR. Ser. fiz. 25 no.8:1038-1042 Ag '61. (MIRA 14:8)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(X-ray spectroscopy)

SACHENKO, V.P.

Note on the "derivatives method" for improving the form of spectra. Izv. AN SSSR. Ser. fiz. 25 no.8:1048-1053 Ag '61. (MIRA 14:8)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(X-ray spectroscopy)

NIKIFOROV, I.Ya.; SACHENKO, V.P.; BLOKHIN, M.A.

Comparison of different methods for improving the form of spectra. Izv. AN SSSR. Ser. fiz. 25 no.8:1054-1059 Ag '61. (MIRA 14:8)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(X-ray spectroscopy)

S/048/62/026/003/010/015
B142/B104

AUTHORS: Blokhin, M. A., Gil'varg, A. B., Nikiforov, I. Ya., and Sachenko, V. P.

TITLE: Two-crystal X-ray spectrometer

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 3, 1962, 397 - 404

TEXT: The adjustment of the new spectrometer is comparatively simple and takes only a few hours. The crystals can be taken out of the apparatus without disturbing the adjustment. The distance between the rotating axes of the crystals is 100 mm. The focus of the X-ray tube is 300 mm distant from the rotating axis of the first crystal. The distance of the rotating axis of the second crystal from the window of the Geiger counter is 100 mm. The second crystal can be rotated by $\pm$ 1.5° from the middle position reading accuracy 0.01°). The spectrometer is not adjusted by means of the crystals but by glass plates. After adjustment, the crystals are inserted to determine the $CuK\alpha_1$ - line and the angle between crystal surface and lattice planes. Eight horizontal plates were built into the collimator to reduce

Card 1/3

Two-crystal X-ray spectrometer

the vertical scattering of the beam to a minimum and yet to obtain high radiation intensities. A beryllium plate inserted between the collimator and the first crystal is to eliminate the focus drift and the effect of feeding-voltage fluctuations. It was difficult to choose the suitable crystals since extreme optical uniformity is required, and the angle between crystal surface and lattice planes shall be as small as possible. Its maximum was 105". Plates parallel to $(10\bar{1}0)$ and $(11\bar{2}0)$ were cut from various quartz crystals and investigated after etching. The purity of the two crystals is determined by the width of the reflection curves. The quality of the plates is estimated from the shadows produced by deviations of the refractive indices. A final examination carried out by means of a polarization system indicates optical inequality of the plates by bright spots. There are 6 figures and 6 references: 1 Soviet and 5 non-Soviet. The two English-language references are: L. G. Parrat, Rev. Scient. Instrum. 5, no. 11, 113 (1934); Rev. Scient. Instrum., 6, no. 5, 113 (1935).

S/048/62/026/003/010/015
B142/B104

Two-crystal X-ray spectrometer

ASSOCIATION: Rostovskiy gos. universitet, Institut kristallografii Akademii nauk SSSR. (Rostov State University, Institute of Crystallography of the Academy of Sciences USSR)

Card 3/3

SACHENKO, V.P.; NIKIFOROV, I.Ya.

Correction of X-ray spectra for symmetric distortion.
Opt. i spektr. 13 no.3:447-450 S '62. (MIRA 15:9)
(X-ray spectroscopy)

S/048/63/027/003/001/025
B108/B114

AUTHORS: Nikiforov, I. Ya., and Sachenko, V. P.

TITLE: The energy bands of titanium with cubic lattice

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 27, no. 3, 1963, 310-313

TEXT: This paper was presented at the 6th Conference on X-ray Spectroscopy, Odessa, July 2 - 10, 1962. The shape of the X-ray spectra of cubic titanium were calculated with the method of the orthogonalized plane waves (C. Herring, Phys. Rev., 57, 1169 (1940)) which represents the orbitals of the crystal as linear combinations of orthogonalized plane waves. For comparison, the energy of Γ and H points in inverse space were calculated with the cell method (B. Schiff, Proc. Phys. Soc., A, 68, 686, 1955). The results are in good agreement. Assuming the Fermi surface to have an energy of the same order as the energy of the H_{12} state (-0.116 Ry), one can conclude that the K_{β_5} band has a width of 5 - 6 ev.

Card 1/2

The energy bands of ...

The dispersion curves show that the maximum of K_{β_5} must be at a certain distance (1 - 2 ev) from the cutoff on the Fermi surface. In the L-absorption spectra a sharp rise directly from the Fermi surface should be observed. A sharp rise in the K-absorption spectra may be expected at a distance of 6 - 8 ev from the Fermi surface. There are 2 figures and 3 tables.

ASSOCIATION: Rostovskiy na-Donu gos. universitet (Rostov na-Donu State University)

S/048/63/027/003/003/025
B108/B114

AUTHORS: Shveytser, I. G., Sachenko, V. P., and Nikiforov, I. Ya.

TITLE: The structure of the energy levels of metallic molybdenum

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 27, no. 3, 1963, 319-321

TEXT: This paper was presented at the 6th Conference on X-ray Spectroscopy, Odessa, July 2 - 10, 1962. The energy levels of the valency band of molybdenum (cubic, body centered, a = 3.14104 Å) were calculated with the method of the orthogonalized plane waves for the Γ, and H points of the $\vec{k}$-space. The radial wave functions of the inner electrons (from 1s to 4p) were calculated with the self-consistent field method (Ridley, C., Proc. Cambridge Philos. Soc., 51, 702, 1955). The results for molybdenum and zirconium (the latter according to S. L. Altmann. Proc. Roy. Soc. A, 244, 141, 1958) are given in Table 2. There are 1 figure and 2 tables.

Card 1/2

Rostov-on-Don State Univ.

SHVEYTSER, I.G.; NIKIFOROV, I.Ya.; SACHENKO, V.P.

Energy spectrum of metallic niobium. Izv. AN SSSR. Ser. fiz. 28 no. 5:797-800 My '64. (MIRA 17:6)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.

ACCESSION NR: AP4038764 S/0048/64/028/005/0797/0800

AUTHOR: Shveytser, I.G.; Nikiforov, I.Ya.; Sachenko, V.P.

TITLE: Concerning the energy spectrum of metallic niobium [Report, Seventh Conference on X-Ray Spectroscopy held in Yerevan 23 Sep - 1 Oct 1963]

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.5, 1964, 797-800

TOPIC TAGS: x-ray spectrum, x-ray absorption, molybdenum, niobium, energy band structure

ABSTRACT: In continuation of previous theoretical and experimental investigations of transition metals of the palladium group (I.G.Shveytser, V.P.Sachenko and I.Ya. Nikiforov, Izv.AN SSSR,Ser.fiz.27,319,1963) the $I\beta_2$ emission and L_{III} absorption spectra of Mo and Nb are compared, and their differences are interpreted in terms of the energy level distributions in the metals as calculated in the orthogonal plane wave approximation. The Mo spectra and energy level distribution are taken from the earlier paper. The Nb emission spectrum was taken from work of M.I.Korsunskiy and Ya.Ye.Genkin (Izv.AN SSSR,Ser.fiz.25,1028,1961) and the Nb L_{III} absorption spectrum was measured for the occasion. The spectra of the two metals are rather

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similar, but the following differences are noted: the $L\beta_2$ emission band of Mo is both wider and more symmetric than that of Nb, and the first L_{III} absorption line of Nb is wider than that of Mo and its maximum is located farther from the absorption edge. Since no self-consistent wave functions are available for Nb, and since orthogonalized Slater functions proved to be insufficiently accurate, the atomic parameters of Nb required for the orthogonal plane wave calculation, namely the Fourier components of the atomic potential, the orthogonality coefficients, and the energy eigenvalues, were obtained by extrapolation from those of Mo. The extrapolation of the energy eigenvalues was performed with the aid of Moseley's law, that of the orthogonality coefficients by means of Hartree's scale transformation of the wave functions, and the Fourier components of the potential were extrapolated by first calculating their dependence on the atomic number with the Fermi-Thomas model. Thirteen orthogonal plane wave functions were employed in the calculation of the energy levels; the method of calculation is described in more detail in the earlier paper. Considerable differences were found between the level distributions in Mo and Nb. In particular, the maximum density of d levels occurs near or below the Fermi surface in Mo and considerably above it in Nb. The L_{III} spectra of the two metals are discussed in some detail in relation to the level distributions, and all the differences noted above are successfully interpreted - in one case (the width of the

ACCESSION NR: AP4038764

Nb $L\beta_2$ band) almost quantitatively. It is concluded that even incomplete calculations of the energy structure of a solid can sometimes make it possible to interpret x-ray spectra semiquantitatively. Orig.art.has: 3 formulas and 3 figures.

ASSOCIATION: Rostovskiy-na-donu gosudarstvenny*y universitet (Rostov-on-the-Don State University)

SUBMITTED: 00 DATE ACQ: 12Jun64 ENCL: 00

SUB CODE: OP NR REF SOV: 002 OTHER: 006

Card 3/3

L 8809-66 EWT(l)/EWT(m)/EWP(j)/T/EWA(m)-2 IJP(c) RM/LHB

ACC NR: AP5024696 SOURCE CODE: UR/0056/65/049/003/0765/0769

AUTHOR: Sachenko, V. P.; Demekhin, V. F.

ORG: Rostov-on-Don State University (Rostovskiy-na-domu gosudarstvennyy universitet)

TITLE: Satellites of x-ray spectra

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 3, 1965, 765-769

TOPIC TAGS: x ray spectrum, spectral line, ionization phenomenon, electron interaction, satellite, photon scattering, nonradiative transition, chemical bonding

ABSTRACT: To obtain information on the ionization mechanism of the inner shells of atoms and on the behavior of electrons in a solid, the authors studied the properties of some types of satellites and their nature. The study is based on the concept of auto-ionization of the atom when the number of inner electron changes, and leads to a single mechanism for the appearance of multiply ionized atoms excited by either electrons or photons. The method is based on the fact that a change in the number of electrons produces a sudden perturbation of the potential of the remaining electrons. The calculated intensities of the x-ray Kα and some Kβ satellites are in agreement with the experimental data. It is shown that nonradiative transitions influence greatly the relative intensity of the KL_I and $KL_{II\ III}$ satellites. The effect of the chemical bonding on the satellite intensity is considered. Authors thank R. V. Vedrinskiy for a number of valuable remarks and a discussion. Orig. art. has: 1 figure and 7 formulas.

SUB CODE: 20/ SUBM DATE: 28Oct64/ ORIG REF: 004/ OTH REF: 008

Card 1/1 jw

BARANOVA,N.M.; BASS, Yu.B.; BOGDANOVICH, V.V.; VIL'GOS, Ye.F.; GRAZHDANTSEV, I.I.; GRYAZNOV, V.I.; GUTOROVA, Ye.D.; KABRIZON, V.M.; MOLYAVKO, G.I.; MOROKHOVSKAYA, M.S.; NOSOVSKIY, M.F.; ROMODANOVA, M.P.; SOSNOV, A.A.; SHEVCHENKO, Ye.S.; USENKO, I.S.; Prinimali uchastiye: BONDAR', A.G., inzh.-gidrogeolog; SACHENKO-SAKUN, V.M., st. topograf; SHELUKHINA, A.V., st. tekhnik-geolog; STOPIK, M.A., st. tekhnik-geolog; REUTOVSKAYA, E.A., tekhnik; BETEKHTIN, A.G., akademik, glav. red.[deceased]

[Nikopol' manganese-ore basin] Nikopol'skii margantsevo-rudnyi bassein. Moskva, Izd-vo "Nedra," 1964. 534 p. (MIRA 17:6)

1. Institut geologicheskikh nauk AN Ukr.SSR (for Baranova, Molyavko, Romodanova, Usenko). 2. Nauchno-issledovatel'skiy institut geologii Dnepropetrovskogo gosudarstvennogo universiteta (for Gryaznov, Nosovskiy). 3. Trest "Dneprogeologiya" (for Bogdanovich, Kabrizon). 4. Trest "Kiyevgeologiya" (for Bass). 5. Trest "Nikopol'-Marganets" (for Vil'gos, Grazhdantsev, Sosnov).

SACHENKOV, A. V.

"Certain Problems of the Stability of Conical Shells Within Elastic Limits." Cand Phys-Math Sci, Kazan' State U, Kazan', 1954. (RZhMekh, Apr 55)

SO: Sum. No. 704, 2 Nov 55 - Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (16).

Sachenkov, A.V.

2172. Myshtari, Kh. M., and Sachenkov, A. V. Stability of cylindrical and conical shells of circular cross section subjected to simultaneous action of axial compression and normal external pressure (in Russian), *Prikl. Mat. Mekh.* 18, 6, 667-674, 1954.

The starting point for solving this problem is differential equations which were developed by the first of the authors for the purpose of investigating the stability of a conical shell under combined compression and torsion. All boundary conditions are taken into consideration. Approximate formulas for the critical value of the normal load of the shell are given.

W. Wierzbicki, Poland

124-57-1-861

Translation from: Referativnyy zhurnal, Mekhanika, 1957, Nr 1, p 114 (USSR)

AUTHOR: Sachenkov, A.V.

TITLE: Approximate Determination of the Lower Boundary of the Critical Loading in Longitudinal Compression of a Thin Conical Shell (Priblizhennoye opredeleniye nizhney granitsy kriticheskoy nagruzki pri prodol'nom szhatii tonkoy konicheskoy obolochki)

PERIODICAL: Izv. Kazansk. fil. AN SSSR, ser. fiz.-matem. i tekhn. n., 1955, Nr 7, pp 16-22

ABSTRACT: Differential equations are set up to describe large deflections of circular conical shells; the expressions stated by Kh. M. Mushtari (Prikl. matem. i mekhanika, 1939, Vol 2, Nr 4) for the deformations of the mean surface of the shell are employed, with due consideration of the squares of the displacements and their derivatives. The author demonstrates that in a deformation of the local instability type these equations are reduced to the system applying to tapered shells [Vlasov, V.Z., Obshchaya teoriya obolochek (General Theory of Shells), 1949] and evaluates the order of magnitude of the terms eliminated therein. The simplified system of equations is applied to the examination

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SACHENKOV, A.V.

Stability of shells beyond the elasticity limit. Izv.Kazan.fil. AN SSSR.Ser.fiz.-mat. i tekh. nauk no.10:81-99 '56. (MLRA 10:8)

1.Fiziko-tekhnicheskiy institut Kazanskogo filiala AN SSSR.
(Elastic plates and shells)

MUSHTARI, Kh.M., red.; ALUMYAE, N.A., red.; BOLOTIN, V.V., red.; VOL'MIR, A.S., red.; GANIYEV, N.S., red.; GOL'DENVEYZER, A.L., red.; ISANBAYEVA, F.S., red.; KIL'CHEVSKIY, N.A., red.; KORNISHIN, M.S., red.; LUR'YE, A.I., red.; SAVIN, G.N., red.; SACHENKOV, A.V., red.; SVIRSKIY, I.V., red.; SURKIN, R.G., red.; FILIPPOV, A.P., red.; ALEKSAGIN, V.I., red.; SEMENOV, Yu.P., tekhn. red.

[Proceedings of the Conference on the Theory of Plates and Shells] Trudy Konferentsii po teorii plastin i obolochek, Kazan', 1960. Kazan', Akad. nauk SSSR, Kazanskii filial, 1960. 426 p. (MIRA 15:7)

1. Konferentsiya po teorii plastin i obolochek, Kazan', 1960. 2. Moskovskiy energeticheskiy institut (for Bolotin). 3. Kazanskiy khimiko-tekhnologicheskiy institut (for Ganiyev). 4. Institut mekhaniki Akademii nauk USSR (for Kil'chevskiy). 5. Kazanskiy gosudarstvennyy universitet (for Sachenkov). 6. Kazanskiy filial Akademii nauk SSSR (for Svirskiy).
(Elastic plates and shells)

S/147/60/000/02/008/020
E031/E413

AUTHOR: Sachenkov, A.V.

TITLE: On the Theory of Plastic-Elastic Stability of Bimetallic Shells

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Aviatsionnaya tekhnika, 1960, Nr 2, pp 69-79 (USSR)

ABSTRACT: In Ref 1, on the basis of the theory of deformation and the theory of plastic flow, were obtained the fundamental physical relations for bimetallic shells. The surface is a soldered one of two layers. The solution of the same problems is given in this paper, but the surface is taken such that with respect to it the physical relations linking the variation of deformation and bending with the variation of the forces and moments is the most simple. The conditions are discussed under which the calculation of the stability of two-layered shells can, with previously given error, be reduced to the calculation for single-layered anisotropic elastic shells. In discussing the physical relations on the theory of deformation, the case of an incompressible material is considered first. In the expressions for the variations

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S/147/60/000/02/008/020
E031/E413

On the Theory of Plastic-Elastic Stability of Bimetallic Shells

in the forces and moments there occurs a parameter z_o - the distance along the normal from the reduced surface to the external surface, which is undetermined. By suitable choice of its value, the maximum simplification can be brought about in the expressions for the coefficients in each particular case. The effect of the compressibility of the material is briefly discussed. Next the solution on the basis of the theory of plastic flow is considered. The next section deals with the stability of plates and shells. The aim is to simplify the calculations. This can be achieved in both the compressible and the incompressible cases. The stability theory of plane bimetallic plates beyond the elastic limit can be reduced to the theory of plane anisotropic plates. The paper concludes with an analysis of the error of the approximate approach and the calculation of the compressibility of the material. There are 4 Soviet references. VB

Card 2/3

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88615
S/147/60/000/004/007/016
E081/E235

AUTHORS: Sachenkov, A. V. and Vybornov, V. G.

TITLE: Stability of the Momentless State of Multi-ply Anisotropic Shells

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Aviatsionnaya tekhnika, 1960, No. 4, pp. 61-71

TEXT: The stability is discussed of the elastic equilibrium of sloping shells subjected to the action of combined loads. The equations of neutral equilibrium in the forces and moments are:

$$\frac{\partial T_1}{\partial x}+\frac{\partial S}{\partial y}=0, \quad \frac{\partial T_2}{\partial y}+\frac{\partial S}{\partial x}=0, \qquad (1.1)$$

$$\frac{\partial^2 M_1}{\partial x^2}+2\frac{\partial^2 H}{\partial x\partial y}+\frac{\partial^2 M_2}{\partial y^2}+\frac{T_1}{R_1}+\frac{T_2}{R_2}+T_{10}\frac{\partial^2 w}{\partial x^2}+T_{20}\frac{\partial^2 w}{\partial y^2}+2S_{10}\frac{\partial^2 w}{\partial x\partial y}=0, \qquad (1.1)$$

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Stability of the Momentless State of Multi-ply Anisotropic Shells

The forces and moments are given by

$$\begin{aligned} T_1 &= C_{11}\varepsilon_1 + C_{12}\varepsilon_2 - K_{11}\varkappa_1 - K_{12}\varkappa_2, \\ T_2 &= C_{12}\varepsilon_1 + C_{22}\varepsilon_2 - K_{12}\varkappa_1 - K_{22}\varkappa_2, \\ S &= C_{66}\omega - 2K_{66}\tau, \quad H = K_{66}\omega - 2D_{66}\tau, \\ M_1 &= K_{11}\varepsilon_1 + K_{12}\varepsilon_2 - D_{11}\varkappa_1 - D_{12}\varkappa_2, \\ M_2 &= K_{12}\varepsilon_1 + K_{22}\varepsilon_2 - D_{12}\varkappa_1 - D_{22}\varkappa_2. \end{aligned} \tag{1.2}$$

where M_1, M_2, H are bending and twisting moments; T_1, T_2, S are forces arising in the shell at the instant of loss of stability; ε_1, ε_2, ω, $\varkappa_1$, $\varkappa_2$, are strains in the middle surface; T_{10}, T_{20}, S_{10} are forces before loss of stability; $1/R_1$, $1/R_2$ are curvatures of the surface of reduction; C_{ij}, K_{ij}, D_{ij} are rigidities of the

Card 2/4

Stability of the Momentless State of Multi-ply Anisotropic Shells

shell, which can be expressed in terms of the elastic constants and thicknesses of the individual layers. When the strains are written in terms of the displacements, a system of three differential equations involving the displacements and the rigidities are obtained, and by expressing the displacements in the form

$$u = u(\alpha x + \beta y) = u(\varphi),\ v = v(\alpha x + \beta y) = v(\varphi),\ w = w(\alpha x + \beta y) = w(\varphi). \quad (1.9), \qquad (1.9)$$

the equations are simplified. The solution of the stability problem is obtained by minimising the integral

$$Q = \int\int (W + W_e - W_0') AB d\alpha d\beta. \quad (2.1) \qquad (2.1)$$

where A, B are Lame's parameters; α, β are Gaussian co-ordinates on the surface of reduction; W_0 is the energy of deformation per unit area of the surface of reduction corresponding to the

Stability of the Momentless State of Multi-ply Anisotropic Shells

original equilibrium form; W_0 is the energy expression containing terms of the first order of smallness; W is the energy of deformation. The minimum condition is applied to the cases of axial compression of a cylindrical shell, and to a sloping spherical shell triangular in plan. Non-linear problems of stability in layered shells with special reference to bimetallic constructions are also considered. There are 7 references: 6 Soviet and 1 non-Soviet.

ASSOCIATION: Kazanskiy gosudarstvennyy universitet, Kafedra mekhaniki
(Kazan' State University, Department of Mechanics)

SUBMITTED: March 26, 1960

28666
S/020/61/140/002/011/023
B104/B102

24.4200 1103 1191 1327

AUTHOR: Sachenkov, A. V.

TITLE: Linearization of equations for the two-dimensional problem in the theory of an ideally plastic body

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 2, 1961, 330-332

TEXT: Two-dimensional states of stress and deformation of an ideally plastic body are described by two equilibrium conditions:
$\partial X_x/\partial x + \partial X_y/\partial y = 0$; $\partial X_y/\partial x + \partial Y_y/\partial y = 0$ (1).
Here, X_x, Y_y, and X_y are the stress components, k_o and k_1 are plasticity constants, and f_o is a positive function of the normal stresses.
If $X_x = \partial^2 F/\partial y^2$, $Y_y = \partial^2 F/\partial x^2$, $X_y = -\partial^2 F/\partial x \partial y$, then Eq. (1) are identically fulfilled. In this case, Saint-Venant's plasticity conditions read

$$(\partial^2 F/\partial y^2 - \partial^2 F/\partial x^2)^2 + 4(\partial^2 F/\partial x \partial y)^2 = 4k_o^2 \quad (4).$$

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Linearization of equations ...

Mises' plasticity condition reads:

$$(\partial^2 F/\partial y^2)^2 - \frac{\partial^2 F}{\partial x^2}\frac{\partial^2 F}{\partial y^2} + (\partial^2 F/\partial x^2)^2 + 3(\partial^2 F/\partial x \partial y)^2 = 4k_1^2 \quad (5).$$

Mises-Schleicher's generalized plasticity condition reads:

$$(\partial^2 F/\partial y^2 - \partial^2 F/\partial x^2)^2 + 4(\partial^2 F/\partial x \partial y)^2 = 4k_o^2 f_o\left\{\frac{1}{2}(\partial^2 F/\partial x^2 + \partial^2 F/\partial y^2)\right\} \quad (6).$$

Eq. (4), (5), and (6) are linearized. For this purpose, they are simplified in the plane of complex numbers. The linearized form of (4) represented in variables of the plane of stress reads:

$\partial^2 \bar{\Phi}/\partial\theta^2 + \partial^2 \bar{\Phi}/\partial\eta^2 + 2\varkappa\eta \frac{\partial^2 \bar{\Phi}}{\partial\theta\partial\eta} : \sqrt{k_o^2 - \eta^2} = 0$, where

$u = -\bar{\Phi} + \eta\frac{\partial \bar{\Phi}}{\partial\eta} + \theta\frac{\partial \bar{\Phi}}{\partial\eta}$, $\eta = \partial u/\partial z$, $\theta = \partial u/\partial\bar{z}$, $u = \partial F/\partial y$, $\varkappa = \pm 1$. The linearized Eq. (5) represented in variables of the plane of stress reads:

$$\partial^2 \bar{\Phi}/\partial\theta^2 - \frac{1}{2}(\partial^2 \bar{\Phi}/\partial\eta^2) + \frac{3\varkappa}{\sqrt{4k_1^2 - \frac{3}{4}\theta^2 - 3\eta^2}}\left\{\frac{1}{4}\theta\frac{\partial^2 \bar{\Phi}}{\partial\theta^2} - \eta\frac{\partial^2 \bar{\Phi}}{\partial\eta\partial\theta}\right\} = 0.$$

Card 2/3

Linearization of equations ...

The author thanks A. P. Kuntsevich and Professor K. Z. Galimov for valuable advice. There are 4 Soviet references.

ASSOCIATION: Kazanskiy gosudarstvennyy universitet im. V. I. Ul'yanova-Lenina (Kazan' State University imeni V. I. Ul'yanov-Lenin)

PRESENTED: March 9, 1961, by Yu. N. Rabotnov, Academician

SUBMITTED: February 28, 1961

Card 3/3

SACHENKOV, L.V.

Calculation of two-layer shells. Izv.Kazar. fil. AN SSSR. Ser. fiz.-mat. i tekh.nauk no.14:75-80 '60. (MIRA 14:11)
(Elastic plates and shells)

SACHENKOV, A.V.

Strength and stability of multi-layer shells. Izv.Kazan. fil. AN SSSR. Ser. fiz.-mat. i tekh.nauk no.14:81-88 '60.
(MIRA 14:11)
(Elastic plates and shells)

Sachenkov, A. V.

POPOVSKIY, P. V.

PHASE I BOOK EXPLOITATION SOV/6206

Konferentsiya po teorii plastin i obolochek. Kazan', 1960.

Trudy Konferentsii po teorii plastin i obolochek, 24-29 oktyabrya 1960. (Transactions of the Conference on the Theory of Plates and Shells Held in Kazan', 24 to 29 October 1960). Kazan', [Izd-vo Kazanskogo gosudarstvennogo universiteta] 1961. 426 p. 1000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Kazanskiy filial. Kazanskiy gosudarstvennyy universitet im. V. I. Ul'yanova-Lenina.

Editorial Board: Kh. M. Mushtari, Editor; F. S. Isanbayeva, Secretary; N. A. Alumyae, V. V. Bolotin, A. S. Vol'mir, N. S. Ganiyev, A. L. Gol'denveyzer, N. A. Kil'chevskiy, M. S. Kornishin, A. I. Lur'ye, G. N. Savin, A. V. Sachenkov, I. V. Svirskiy, R. G. Surkin, and A. P. Filippov. Ed.: V. I. Aleksagin; Tech. Ed.: Yu. P. Semenov.

PURPOSE: The collection of articles is intended for scientists and engineers who are interested in the analysis of strength and stability of shells.

Card 1/14

Transactions of the Conference (Cont.) SOV/6206

COVERAGE: The book is a collection of articles delivered at the Conference on Plates and Shells held in Kazan' from 24 to 29 October 1960. The articles deal with the mathematical theory of plates and shells and its application to the solution, in both linear and nonlinear formulations, of problems of bending, static and dynamic stability, and vibration of regular and sandwich plates and shells of various shapes under various loadings in the elastic and plastic regions. Analysis is made of the behavior of plates and shells in fluids, and the effect of creep of the material is considered. A number of papers discuss problems associated with the development of effective mathematical methods for solving problems in the theory of shells. Some of the reports propose algorithms for the solution of problems with the aid of electronic computers. A total of one hundred reports and notes were presented and discussed during the conference. The reports are arranged alphabetically (Russian) by the author's name.

Card 2/14

ACCESSION NR: AR4015138 S/0124/63/000/012/V010/V010

SOURCE: RZh. Mekhanika, Abs. 12V75

AUTHOR: Sachenkov, A.V.

TITLE: One one approach to the solution of nonlinear problems on the stability of thin shells

CITED SOURCE: Sb. Nelineyn. teoriya plastin i obolochek. Kazan', Kazansk. un-t, 1962, 3-41

TOPIC TAGS: thin shell, thin shell elasticity, nonlinear elasticity problem, elasticity problem, Bubnov method

TRANSLATION: In studying local losses of stability within the confines of the theory of small camber inclined shells, V.Z. Vlasov determined the critical load, ignoring the forms of equilibrium, and therefore the boundary-value conditions of the problem (Prikladnaya Matematika i Mekhanika (Applied Mathematics and Mechanics) 1944, Vol 8, No 2, 108-140; General Shell Theory, Moscow-Leningrad, Gostekhizdat, 1949). This isolation of the problem of finding the lower critical load from the

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ACCESSION NR: AR4015138

problem of determining the form of equilibrium is carried out in the present paper on the basis of the nonlinear theory of Marguerre-Vlasov inclined elastic shells of finite camber. (Marguerre, K., Proc. Internat. Congr. Appl. Mech., Cambridge, Mass., 12-16 Sept 1938. New York-London, 1939, 93-101) with consideration of the initial sag whose form is similar to that of the expected form of stability loss, when the initial stress state is momentless. The possibility of independent determination of the critical load is due to the branching of the solutions of the basic differential equations of the problem upon attainment of the critical load; here the load can be determined in several ways, all of which lead to a single value. The author analyzes the stability of a spherical shell and ellipsoid with a uniform external pressure, and of a round cylindrical shell with uniform axial compression for isotropic and orthotropic materials.

On the basis of the abstracter's equations (Inzhenernyy Sbornik (Engineering Papers), 1953, Vol 17), the author determines the lower critical load of a bimetallic ellipsoid for a uniform transverse external pressure and a bimetallic round cylindrical shell compressed uniformly in the axial direction.

The resulting lower critical loads are close to the values found by the energy method (for homogeneous and orthotropic shells).

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ACCESSION NR: AR4015138

The basic results described above were published by their author previously (Doklady AN SSSR (Reports of the Academy of Sciences USSR), 1962, Vol 145, No 6, 1243-1246, RZh. Mekhanika, 1963, 9V85).

Introducing a geometrical criterion of the isothermicity of bending surfaces in buckling, A.V. Pogorelov finds the lower critical loads for elastic homogeneous shells (On the Theory of Convex Elastic Shells in the Transcritical Stage. Khar'kov, Khar'kovskiy Universitet, 1960; Cylindrical shells with transcritical deformations. 1. Axial compression. Khar'kov, Khar'kovskiy un-t, 1962; 2. op. cit., External pressure, Khar'kov, Khar'kovskiy un-t, 1962; 3. op. cit., Rotation. Khar'kov, Khar'kovskiy un-t, 1962). The method discussed in the article and the method based on the assumption of isothermicity of the buckling surfaces are different expressions of the same fact -- the bifurcation of solutions of the initial nonlinear equations of the problem.

The author evaluates the lower critical loads of a hinge-supported round cylindrical shell with concurrent rotation and uniform external pressure under the assumption that the buckling surface is similar to an isothermic surface and is characterized by the following equation (w is the camber; x, y are orthogonal coordinates; R is the radius of the shell mid-surface):

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ACCESSION NR: AP4015138

$$\frac{\lambda}{R}\frac{\partial^2 w}{\partial x^2}+\frac{\partial^2 w}{\partial x^2}\frac{\partial^2 w}{\partial y^2}-\left(\frac{\partial^2 w}{\partial x \partial y}\right)^2=0 \qquad (*)$$

By applying the Bubnov procedure to expression (*), it is possible to determine parameters w_1 and w_2 of the function to be approximated which is given in the form (l is the length of the shell):

$$w=w_1 \sin\frac{m\pi x}{l}\sin\frac{ny}{R}+w_2 \sin^2\frac{m\pi x}{l}$$

The author then uses the energy method, while the force function is determined for given w from the compatibility relation. E.I. Grigolyuk.

DATE ACQ: 31Dec63 SUB CODE: MM ENCL: 00

Card 4/4

S/879/62/000/000/017/088
D234/D308

AUTHOR: Sachenkov, A. V. (Kazan')

TITLE: Some equations of the theory of multilayer shells

SOURCE: Teoriya plastin i obolochek; trudy II Vsesoyuznoy konferentsii, L'vov, 15-21 sentyabrya 1961 g. Kiev, Izd-vo AN USSR, 1962, 137-140

TEXT: Using the basic relations of semi-momentless theory and assuming that the shell is shallow in the direction of variation of R_1, the author obtained a system of equations having the same form as those for a single-layer shell, except that two of the coefficients are complex instead of being purely imaginary. For medium deflections simplified nonlinear equations are formulated:

$$F_{yyyy} + K^*\left(\frac{1}{R_2} w_{xx} + \frac{1}{R_1} w_{yy} + w_{xx} w_{yy} - w_{xy}^2\right) = 0;$$

Card 1/3

Some equations of ...

$$D''w_{yyyy} - \frac{1}{R_2}F_{xx} - \frac{1}{R_1}F_{yy} - T^*_{10}w_{xx} - T^*_{20}w_{yy} + 2F_{xy}w_{xy} +$$

where

$$+ t_{10}(w_{xx}w_{yy} - w^2_{xy}) + q_n = 0,$$

$$T^*_{10} = \left(F_{yy} - \frac{t_{o,o}}{R_1}\right), \quad T^*_{20} = \left(F_{xx} - \frac{t_{o,o}}{R_1}\right) \qquad (2.1)$$

The underlined term is small. If the layers are isotropic the first two equations in terms of displacements will coincide with those of single-layer shells and the third equations will be:

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Some equations of ...

$$D_{11}\nabla^2\nabla^2 w - \frac{T_1^*}{R_1} - \frac{T_2^*}{R_2} - T_1^* w_{xx} - T_2^* w_{yy} - 2S^* w_{xy} -$$

$$- K_{12}\underline{(w_{xx}w_{yy} - w_{xy}^2)} + q_n = 0 \qquad (2.2)$$

The underlined term is again small. Approximate equations are also formulated for tangential displacements of a bimetallic cylinder whose layers have equal Poisson's coefficients.

Card 3/3

S/879/62/000/000/056/088
D234/D308

AUTHORS: Danilov, V. I. and Sachenkov, A. V. (Kazan')

TITLE: Some nonlinear problems of stability of a cylindrical shell with uniform external pressure

SOURCE: Teoriya plastin i obolochek; trudy II Vsesoyuznoy konferentsii, L'vov, 15-21 sentyabrya 1961 g. Kiev, Izd-vo AN USSR, 1962, 336-338

TEXT: The authors investigate the stability of a shell one edge of which is free and the other either freely supported or clamped. The problems are solved by the energy method in the second approximation. Expressions for the energy are given. It is stated that the final results coincide with those obtained previously by F. S. Isanbayeva in two papers (up to a constant factor), except that the essential quantity is the double length of the shell. Conclusion: the upper and lower critical loads of a shell in the above cases are equal to those of a shell having twice the same length, freely supported along both edges.

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24420

S/198/62/008/002/006/011
D299/D301

AUTHOR: Sachenkov, O.V. (Kazan')

TITLE: Stress equations in the theory of bimetallic shells

PERIODICAL: Prykladna mekhanika, v. 8, no. 2, 1962, 155 - 158

TEXT: The complex transformation is considered of the linear stress-equations for non-shallow bimetallic shells with arbitrary Poisson ratios of the layers. Thereby a system of equations is obtained of lower order (by two) than the original equations. The obtained system constitutes a generalization of V.V. Novozhilov's equations (Ref. 3: Teoriya tonkikh obolochek (Theory of Thin Shells), Sudpromgiz, 1951). In the following, the notations of Ref. 3 (Op.cit.) are adopted. It is stipulated to denote the quantities which refer to the external layer by a single prime, and those which refer to the internal layer - by 2 primes. In setting up the compatibility equations, the relationships derived by the author in an earlier work were used, viz.:

$$T_1 = C_{11}[(\varepsilon_1 + \mu_1\varepsilon_2) + \nu_1\varkappa_2]; \quad T_2 = C_{11}[(\varepsilon_2 + \mu_1\varepsilon_1) + \nu_1\varkappa_1] \quad (1)$$

$$S = C_{11}\left[\frac{1}{2}(1-\mu_1)\omega - \nu_1\tau\right]; \quad H = D_{11}\left[(1-\mu_2)\tau - \frac{\nu_2}{2}\omega\right],$$
$$M_1 = D_{11}[(\varkappa_1 + \mu_2\varkappa_2) + \nu_2\varepsilon_2]; \quad M_2 = D_{11}[(\varkappa_2 + \mu_2\varkappa_1) + \nu_2\varepsilon_1], \tag{1}$$

where C, D, μ and ν are given by expressions. In deriving Eq. (1), the reduction surface was chosen in such a way, so as to render Eq. (1) very simple. For convenience, Eq. (1) is transformed. Thereupon the equilibrium equations and the conditions for the continuity of deformations are set up. After calculations, one obtains a symmetric system of equations, the first of which being

$$(\overrightarrow{1,2}) = \frac{1}{A_1A_2}\left[\frac{\partial A_2T_1}{\partial\alpha_1} + \frac{\partial A_1S}{\partial\alpha_2} + \frac{\partial A_1}{\partial\alpha_2}S - \frac{\partial A_2}{\partial\alpha_1}T_2\right] +$$
$$+ \frac{1}{A_1R_1}\frac{\partial}{\partial\alpha_1}[D_{11}(1+\mu_2)(\varkappa_1+\varkappa_2) + \beta(1-\mu_1)(T_1+T_2)] = -q_1, \tag{7}$$

where the sign $1\overrightarrow{\leftarrow}2$ signifies that the 3rd and 4th equation can be obtained by permutation of indexes from the 2nd and 1st equation. As system (7) is symmetrical, it is possible to effect a complex transformation (as in the case of a one-layer shell), reducing the

number of original equations by half. After introducing complex functions, Eqs. (7) are transformed into

$$\frac{1}{A_1A_2}\left[\frac{\partial A_2\overline{T}_1}{\partial a_1}+\frac{\partial A_1\overline{S}}{\partial a_2}+\frac{\partial A_1}{\partial a_2}\overline{S}-\frac{\partial A_2}{\partial a_1}\overline{T}_2\right]+\frac{\beta^*}{A_1R_1}\frac{\partial\overline{T}}{\partial a_1}+q_1=0;$$

$$\frac{1}{A_1A_2}\left[\frac{\partial A_1\overline{T}_2}{\partial a_2}+\frac{\partial A_2\overline{S}}{\partial a_1}+\frac{\partial A_2}{\partial a_1}\overline{S}-\frac{\partial A_1}{\partial a_2}\overline{T}_1\right]+\frac{\beta^*}{A_2R_2}\frac{\partial\overline{T}}{\partial a_2}+q_2=0; \qquad (9)$$

$$\Delta\overline{T}+\mu^*\left(\frac{\overline{T}_1}{R_1}+\frac{\overline{T}_2}{R_2}\right)-\mu^*q_n=0;$$

$$\overline{T}=\overline{T}_1+\overline{T}_2;\quad \beta^*=(\beta+i\mu:C_{11});\quad \mu^*=(-K_{12}+i\mu):D_{11}(1+K_{12}^2:\mu^2),$$

which coincide with Novozhilov's equations. For shallow shells, the terms with β^* can be neglected; thereupon the introduction of a complex stress-function F, makes it possible to reduce system (9) to a single 4th order equation

$$\triangle\triangle(F)+\mu^*D(F)-\mu^*q_n=0, \qquad (11)$$

where $\triangle$ and D are operators. There are 8 Soviet-bloc references.

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Stress equations in the theory of ... S/198/62/008/002/006/011
D299/D301

ASSOCIATION: Kazans'kyy derzhavnyy universytet (Kazan State University)

SUBMITTED: April 9, 1960

Card 4/4

SACHENKOV, A.V. [Sachenkov, O.V.] (Kazan')

Theory of an intense bending of plates and shallow shells.
Prykl.mekh. 8 no.4:443-445 '62. (MIRA 15:9)

1. Kazanskiy gosudarstvennyy universitet.
(Elastic plates and shells)

24.4200

40383
S/020/62/145/006/004/015
B112/B104

AUTHOR: Sachenkov, A. V.

TITLE: Bulging surfaces of thin shells affected by local loss of stability

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 6, 1962, 1243-1246

TEXT: The non-linear system

$$\nabla^2\nabla^2 F - Et\left(\frac{1}{R_2}W_{xx}+\frac{1}{R_1}W_{yy}\right)+EtL(W)=0,\quad L(W)=W_{xx}W_{yy}-W_{xy}^2, \tag{1}$$

$$\nabla^2\nabla^2 W+\frac{1}{D}\left(\frac{1}{R_2}F_{xx}+\frac{1}{R_1}F_{yy}\right)-\frac{1}{D}(F_{xx}W_{yy}+F_{yy}W_{xx}-2F_{xy}W_{xy})+\frac{P}{D}=0 \tag{1}$$

is solved by expressions of the form $F = i(AW - T_0y^2/2)$; for the cylinder and $F = i(AW - T_0(x^2 + y^2)/2)$ for the sphere. To determine the constant A and the compression load T_0, the following formulas are derived: $A = \pm\sqrt{Et\mathfrak{D}/2}$, $T_0R = E + D/A - A$. The

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tension $T_o R$ is shown to correspond with a real state of the shell. It is shown that the bulging surface of a shell under the action of an axial compression near the lower critical amount is similar to an isometric surface.

ASSOCIATION: Kazanskiy gosudarstvennyy universitet im. V. I. Ul'yanova-Lenina (Kazan' State University imeni V. I. Ul'yanov-Lenin)

PRESENTED: March 29, 1962, by Yu. N. Rabotnov, Academician

SUBMITTED: March 23, 1962

ACCESSION NR: AP3004720 S/0147/63/000/002/0044/0049

AUTHOR: Sachenkov, A. V.

TITLE: Contribution to the calculation of the buckling stability of flat plates

SOURCE: IVUZ. Aviats. tekhnika, no. 2, 1963, 44-49

TOPIC TAGS: structural strength, buckling, buckling strength, flat plate, uniformly compressed plate, membrane analogy, vibrating membrane, oscillating membrane, isotropic plate, circular plate, slender elliptical plate, elliptical plate, semicircular plate, equilateral triangle plate, isosceles right-triangle plate, anisotropic plate, three-layer plate, sandwich plate, filler

ABSTRACT: This theoretical paper examines problems of the buckling stability of flat plates in the elastic range. Section 1, entitled "Stability of uniformly compressed plates," establishes an analogy between the problem of the buckling stability of a peripherally hinge-supported, uniformly compressed, plate and the well-understood problem of the free oscillations of a plane membrane. Several formulas are adduced for the calculation of the buckling stability of plates having various contours, including (a) isotropic plates, which comprise (1) circular, (2) slender-ellipse, (3) semicircular, (4) equilateral-triangle, and (5) isosceles-right-triangle

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ACCESSION NR: AP3004720

plates; (b) anisotropic plates; and (c) three-layer flat sandwich plates with lightweight filler. In Section 2, the problem of the shear stability of a single-layer annular plate, peripherally hinge-supported and clamped, is solved. Orig. art. has 12 numbered equations.

ASSOCIATION: none

SUBMITTED:	15Sep62	DATE ACQ:	06Sep63	ENCL:	00
SUB CODE:	AP	NO REF SOV:	004	OTHER:	001

Card 2/2

SACHENKOV, A.V. (Kazan')

"The determination of frequencies of free vibrations of simply supported flat plates and shallow spherical shells on the basis of mathematical analogy"

Report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics Moscow 29 Jan - 5 Feb 64.

L 29418-66 EWP(k)/EWI(d)/EWI(m)/EWP(w)/EWP(v) IJP(c) EM/WW
ACC NR: AR5020404 SOURCE CODE: UR/0124/65/000/008/V013/V013

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B

AUTHOR: Sachenkov, A. V.; Gallyamov, T. K.

TITLE: Large depressions in slanted rotation shells with a zero bend rigidity and affected by steady inside pressure 24

SOURCE: Ref. zh. Mekhanika, Abs. 8V84

REF SOURCE: Sb. Issled. po teorii plastin i obolochek, No. 2. Kazan', Kazansk. un-t, 1964, 71-78

TOPIC TAGS: material structure, material deformation, motion mechanics, rotation, approximation method, spheric shell structure, conic shell structure, pressure effect, shell deformation

ABSTRACT: The problem of an ultracritical state of slanted rotation shells with a zero bend rigidity and considering large depressions was examined. For the solution of this problem the authors used the consecutive approximation method and accepted the deformed surface of the isometric as the zero approximation. The suggested method was applied to studies of spherical and conical shells affected by inside pressure. A comparison of the data obtained with that provided by

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L 29418-66

ACC NR: AR5020404

0

other authors showed that a precise solution was already obtained with the second approximation. Ye. F. Burmistrov

SUB CODE: 20/ SUBM DATE: none

Card 2/2 UC

L 01494-66 EWT(d)/EWT(m)/EWP(w)/EWP(v)/EWP(k)/EWA(h)/ETC(m) WW/EM

ACCESSION NR: AR5019379 UR/0124/65/000/007/V017/V017

SOURCE: Ref. zh. Mekhanika, Abs. 7V117

AUTHOR: Sachenkov, A.V.

TITLE: Use of complex equations and the mathematical similarity method in problems on stability and free vibrations of plates and shells

CITED SOURCE: Sb. Itog. Nauchn. konferentsiya Kazansk. un-ta za 1963 g. Sekts. matem., kibernet. i teoriya veroyatn., mekhan. Kazan', 1964, 134-135

TOPIC TAGS: shell structure stability, cylindric shell structure, shallow shell, flat plate, Bessel equation, shell vibration, mechanical vibration

TRANSLATION: Complex equations are employed in solving linear problems on stability and vibration of cylindrical and tapered shells. It is shown that problems on stability and vibration of closed shells of the cylindrical class are mathematically similar to the problem on stability of a compressed rod when homogeneity of the primary stressed state is postulated. An analysis of the stability of a tapered circular shell under shear, axial compression, and a specially selected variable external pressure

Card 1/2

L 01494-66

ACCESSION NR: AR5019379

0

is reduced to solving the Bessel equation. Similarly, a problem on stability of a truncated shallow and spherical segment under torsion and internal pressure is reduced to an analysis of the Bessel equation. The author discusses the stability of a closed, flat, and circular plate subject to shear, as well as shear acting on a plate cut from a ring along two radii with a mutual angle smaller than π. The author considers the stability and vibration of simple-edge supported, uniformly compressed, flat plates and shallow spherical shells bounded in the plane by rectilinear segments.

SUB CODE: AS, MA ENCL: 00

Card 2/2

L 12605-65 EWT(d)/EWT(m)/EWP(w)/EWA(d)/EWP(v)/EWP(k)/EWA(h) Pf-4/Peb
ACCESSION NR: AP4043416 EM S/0147/64/000/003/0029/0037

AUTHOR: Sachenkov, A. V.

TITLE: Stability investigation of cylinder-like shells by introducing a complex displacement function

SOURCE: IVUZ. Aviatsionnaya tekhnika, no. 3, 1964, 29-37

TOPIC TAGS: shell of revolution, shell stability, shell buckling, shell torsion, shell compression, critical load, buckling load

ABSTRACT: The stability of closed shells of revolution (with a very shallow meridional circular arc) under the combined action of constant longitudinal compression, external pressure, and torques applied to the ends of the shells is discussed in linear formulation under the assumption that membrane stresses are independent of coordinates. A complex deflection function is introduced into the solution of initial dynamics equations of elastic shells, and it is shown that the complex coefficients of this function become real under critical loading. Particular cases of the static stability under external pressure and under torsion of shells of revolution

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L 12605-65
ACCESSION NR: AP4043416

with a very large radius of meridional curvature with simply supported ends and of those shells with one end simply supported and the other end hinged are examined, formulas for critical loading are derived, and the buckling behavior is compared with that of circular cylindrical shells. Orig. art. has: 32 formulas.

ASSOCIATION: none

SUBMITTED: 29Nov63 ATD PRESS: 3089 ENCL: 00

SUB CODE: AS NO REF SOV: 006 OTHER: 000

Card 2/2

ACC NR: AT6032965 SOURCE CODE: UR/3228/64/000/002/0057/0070

AUTHOR: Sachenkov, A. V.

ORG: none

TITLE: Stability of a circular conical shell under the joint action of stresses

SOURCE: Kazan. Universitet. Issledovaniya po teorii plastin i obolochek, no. 2, 1964, 57-70

TOPIC TAGS: shell deformation, complex stress, conic shell structure

ABSTRACT: The author investigates the stability of a conical shell under the action of axial compression, torsion by terminal pairs, and variable external pressure which decreases toward the larger base according to the law $p = C/r^3$. As the basis for calculations, a simplified system of equations for a neutral equilibrium of non-slanting shells is taken which is equivalent to a single equation of the fourth order with respect to a function of bending and the longitudinal coordinate (see Sachenkov, Izv. Kazan' Section Acad. Nauk SSSR, Ser. Fiz.-mat. i Tekhn. Nauk, No. 12 (1958). The equation for equilibrium of the projections of forces upon the normal to the middle surface of the shell is integrated with respect to the angle coordinate by a variational method, thus reducing the two-dimensional problem to an one-dimensional one. The system of two ordinary differential equations is reduced, by the introduction

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L 10435-67

ACC NR: AT6032965

of a complex function, to one equation of the second order. The latter is integrated exactly in terms of Bessel functions. The obtained formulas are generalizations of those obtained by Kh. M. Mushtari (Izv. Kazan' Fiz-mat. Ob-va XI, ser. 3 (1938)). Orig. art. has: 3 tables and 51 equations.

SUB CODE: 20/ SUBM DATE: --Jun63/ ORIG REF: 010

Card 2/2

L 01947-67 EWP(k)/EWT(d)/EWT(m)/EWP(w)/EWP(v) IJP(c) EM/WW

ACC NR: AR6021885 (N) SOURCE CODE: UR/0124/66/000/003/V016/V016

AUTHOR: Sachenkov, A. V.

TITLE: Determining the free vibration frequencies of orthotropic flat shells on the basis of analogy

SOURCE: Ref. zh. Mekhanika, Abs. 3V107

REF SOURCE: Sb. Issled. po teorii plastin i obolochek. No. 3. Kazan', Kazansk. un-t, 1965, 181-188

TOPIC TAGS: orthotropic shell, flat shell, thin shell, shell vibration

ABSTRACT: Thin elastic orthotropic flat shells not significantly differing from spherical shells are considered. The equations of their dynamics are recorded on the basis of an analogy with the free oscillations of an anisotropic flat plate. In determining the frequencies only boundary conditions for deflection are solved. A solution is also obtained for the inverse problem: the rigidity characteristics of shell are determined for a given frequency of free oscillations. [Translation of abstract] [AM]

SUB CODE: 13, 20/

Card 1/1 gd